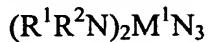


What Is Claimed Is:

1. A method for producing a Group III nitride material, said method comprising converting a Group III azide of the formula:



under conditions sufficient to produce a Group III nitride material of the formula:

5 M^1N

wherein

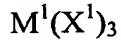
each of R^1 and R^2 is independently a hydrocarbyl;

and

M^1 is a Group III metal.

2. The method of Claim 1, wherein the Group III azide is produced by the step comprising:

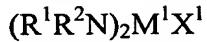
(a) reacting a Group III metal salt of the formula:



5 with a metal amide compound of the formula:



under conditions sufficient to produce a Group III metal amide of the formula:



and

10 (b) reacting the Group III metal amide with a metal azide to produce the Group III azide,

wherein

M^2 is a Group I or Group II metal ion;

each X^1 is independently a ligand; and

15 M^1 , R^1 and R^2 are those defined in Claim 1.

3. The method of Claim 2, wherein each X^1 is independently a halide.

4. The method of Claim 2, wherein the metal azide is selected from the group consisting of sodium azide, lithium azide, potassium azide, cesium azide, ammonium azide, and a combination thereof.

5. The method of Claim 1, wherein the reaction atmosphere comprises an amine compound, an inert gas or a combination thereof.

6. The method of Claim 5, wherein the amine compound is of the formula:



wherein each of R³, R⁴ and R⁵ is independently hydrogen or hydrocarbyl.

7. The method of Claim 6, wherein the reaction atmosphere comprises the amine compound, nitrogen, argon, helium or a mixture thereof.

8. The method of Claim 7, wherein the amine compound comprises ammonia.

9. The method of Claim 1, wherein M¹ is selected from the group consisting of Ga, Al, In, and a mixture thereof.

10. The method of Claim 1, wherein the reaction temperature is from about 100 °C to about 700 °C.

11. The method of Claim 1, wherein the reaction temperature is from about 100 °C to about 400 °C.

12. The method of Claim 1, wherein the reaction temperature is from about 200 °C to about 300 °C.

13. The method of Claim 10 further comprising crystallizing the Group III nitride material from the reaction mixture by cooling the reaction temperature until a super saturated solution is achieved.

14. The method of Claim 13, wherein the reaction cooling rate is in the range of about 0.001 °C/hr to about 1 °C/hr.

15. The method of Claim 13 further comprising introducing a nucleation site to the reaction mixture.

16. The method of Claim 15, wherein the nucleation site comprises a seed crystal of material with a similar lattice constant relative to the Group III nitride material.

17. The method of Claim 1, wherein the reaction pressure is from about 1 atmosphere to about 1000 atmospheres.

18. The method of Claim 1, wherein a reaction vessel comprises a nitrogen-containing crucible.

19. The method of Claim 18, wherein the nitrogen-containing crucible comprises a boron nitride crucible or a silicon nitride crucible.

20. The method of Claim 1, wherein the Group III nitride material is in a nano crystal form.

21. The method of Claim 1, wherein the Group III nitride material is in a bulk crystal form.

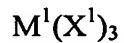
22. The method of Claim 1, wherein said step of converting the Group III azide to the Group III nitride comprises decomposition of the Group III azide to the Group III nitride.

23. The method of Claim 22, wherein said decomposition comprises thermal decomposition.

24. The method of Claim 22, wherein said decomposition comprises photodecomposition.

25. A method for producing a Group III nitride material, said method comprising:

(a) reacting a Group III metal salt of the formula:



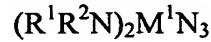
5 with a metal amide compound of the formula:



under conditions sufficient to produce a Group III metal amide of the formula:



(b) reacting the Group III metal amide with a metal azide under conditions
10 sufficient to produce a Group III azide of the formula:



and

(c) decomposing the Group III azide under conditions sufficient to
produce a Group III nitride material of the formula:

15 M^1N

wherein

M^1 is a Group III metal;

M^2 is a Group I or Group II metal ion;

each X^1 is independently a ligand; and

20 each of R^1 and R^2 is independently a hydrocarbyl.

26. The method of Claim 25, wherein M^1 is selected from the group consisting of Ga, Al, In, and a mixture of two or more thereof.

27. The method of Claim 25, wherein said decomposition step comprises thermal decomposition.

28. The method of Claim 27, wherein said thermal decomposition comprises heating the Group III azide to a temperature of at least 100 °C.

29. The method of Claim 28, wherein said thermal decomposition comprises heating the Group III azide to a temperature range of from about 200 °C to about 300 °C.

30. The method of Claim 25, wherein said decomposition step comprises photolysis.